

Reply to “Reply to “Comment on *Nature* 586, 373 (2020) by E. Snider *et al.*””

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In their Reply [1] to our Comment [2, 3], the authors explain that the background signal subtracted from the raw data for pressure 160 GPa to obtain the superconducting signal is a “UDB_1 background”, where UDB stands for “user defined background”. Here we point out that in order for this to be understandable, it is necessary to clearly explain how the user obtains the UDB_1 background. We are unable to find a sufficiently clear explanation of the process in the Reply [1] that would allow a reader to reproduce it. This work was performed in collaboration with D. van der Marel.

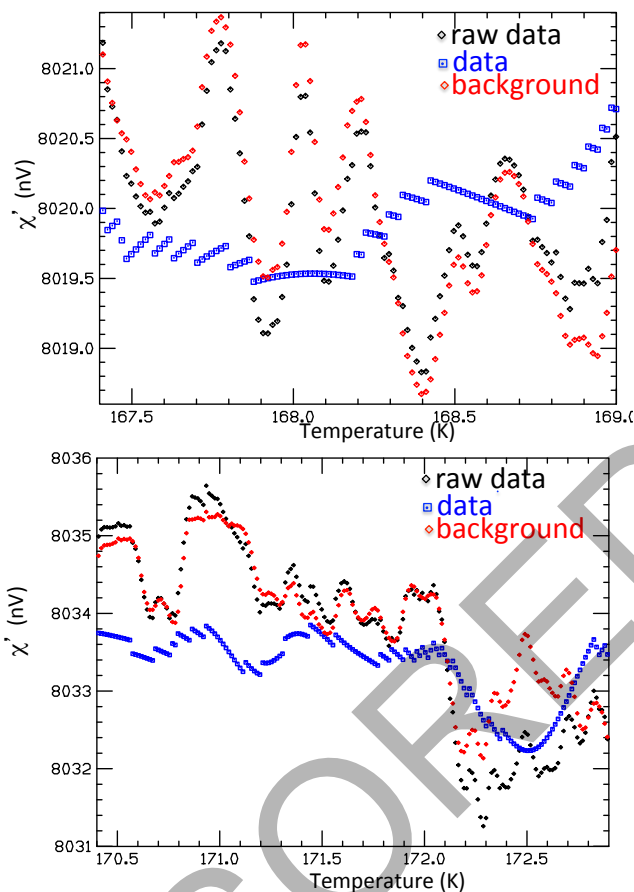


FIG. 1: Raw data (black points), data (blue points) and background signal inferred by subtraction (red points), obtained from the numerical values reported in Table 5 of Ref. [4], for the low and high temperature regions of the 160 GPa data. In the upper panel, the background signal (red points) were shifted upward by 18.5 nV to fit on the figure. The data (blue points) were shifted upward by 8038.4 nV (8038.4 nV) in the upper (lower) panel to fit on the figure.

Fig. 1 shows the raw data (black points) and the superconducting signal (blue points) for low and high temperature regions around the reported superconducting transition for pressure 160 GPa, given by the authors of the Reply [1] to our Comment [2, 3] in Table 5 of ref. [4]. The red points in Fig. 1 are what has to be subtracted from the black points in order to obtain the blue points. Therefore, the red points are the “user defined background 1” (UDB_1) defined by the authors of the Reply [1]. A list of the numerical values of this “user defined background 1” that we obtained by subtraction of the superconducting signal from the raw data is given in [5].

The Reply [1] does not explain the process by which these numerical values are obtained by the user. In table 5 published by the authors in ref. [4], there are 438 numbers for the raw data versus temperature. There has to be a process to obtain 438 numbers for UDB_1, that are then subtracted from the raw data to obtain the 438 numbers for the superconducting signal given in table 5 of ref. [4].

The process by which the 438 numbers of UDB_1 are obtained from the 438 numbers for the measured raw data is not explained in the Reply [1] to our Comment [2, 3].

In the absence of this explanation, the Reply [1] cannot be understood.

We hope the authors will update their posting to include an explanation of the process by which the 438 numerical values for UDB_1 are generated, so that a reader can reproduce the process of obtaining the superconducting signal from the raw data.

Acknowledgments

This work was performed in collaboration with D. van der Marel, who chose not to be listed as an author for personal reasons.

- [1] R. P. Dias and A. Salamat, “Reply to “Comment on *Nature* 586, 373 (2020) by E. Snider *et al.*”” [arXiv:2201.11883](https://arxiv.org/abs/2201.11883) (2022).
[2] D. van der Marel and J. E. Hirsch, “Comment on Na-

ture 586, 373 (2020) by E. Snider *et al.*”, [arXiv:2201.07686](https://arxiv.org/abs/2201.07686) (2022).

- [3] An extended version of our Comment is given in: J. E. Hirsch, “Analysis Of Ac Magnetic Susceptibility Data Of

A Room Temperature Superconductor”, [Preprints 2022, 2022020005 \(2022\)](#).

[4] R. P. Dias and A. Salamat, “Standard Superconductivity in Carbonaceous Sulfur Hydride”, [arXiv:2111.15017](#), Dec. 28, 2021.

[5] Numerical values for all the data given in the tables of Ref. [4] are publicly available on <https://jorge.physics.ucsd.edu/cshdata.html>.

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